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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/554,010

10/21/2005

Dirk Jeroen Breebart

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS

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BRIARCLIFF MANOR, NY 10510

EXAMINER

PULLIAS, JESSE SCOTT

ART UNIT

PAPER NUMBER

2626

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/554,010	<b>Applicant(s)</b> BREEBART ET AL.	
	<b>Examiner</b> JESSE S. PULLIAS	<b>Art Unit</b> 2626	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 August 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 and 13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 August 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This office action is in response to correspondence filed 08/21/08 regarding application 10/554010, in which claims 1-10 were amended, claims 11-12 were cancelled, and new claim 13 was added. Claims 1-10 and 13 are pending in the application and have been considered.

### ***Response to Arguments***

2. Applicant's amendment to claim 6 overcomes the rejection under 35 U.S.C. 112, and so the rejection is withdrawn.
3. Since applicant has cancelled claim 11, the rejection under 35 U.S.C. 101 of this claim is moot.
4. Applicant's arguments with respect to claims 1-10 and 13 on pages 8-10 of the Remarks have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4, 7-10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum et al. (5,918,223) in view of Sheirer et al. ("Construction and

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Evaluation of a Robust Multifeature Speech/Music Discriminator". Proceedings of the 1997 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '97), Vol. 2, p1331-1334).

Consider claims 1 and 8, Blum discloses a system and method for classifying at least one audio signal (**Abstract lines 3-4**, the analysis of audio data can be used to classify) into at least one audio class (**Abstract lines 7-8**, classes of audio files) by:

analyzing said audio signal to extract at least one predetermined audio feature (**Abstract lines 1-4**, analysis... of audio files produces a set of feature vectors);

performing a frequency analysis on a set of values of said extracted predetermined audio feature at different time instances resulting in a magnitude spectrum of said extracted predetermined audio feature (**Col 15 lines 43-44**, bass spectrum, which represents the bass trajectory at different time instances, is subjected to an FFT);

deriving at least one further audio feature representing a temporal behavior of said extracted predetermined audio feature by parameterizing said magnitude spectrum (**Col 15 lines 50-60**, beats detected from magnitude peaks representing a temporal behavior); and

classifying said audio signal based on said further audio feature (**Col 21 lines 53-65**, the signal is classified into categories using statistical measures derived from the feature vectors).

While Blum discloses a magnitude spectrum, Blum does not specifically mention a power spectrum.

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Sheirer discloses a power spectrum (**p1131 Col 2**).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Blum by using spectral power instead of spectral magnitude, which would aid in peak detection by enhancing contrast between spectral peaks and valleys.

With respect to claim 2, Blum discloses that at least one predetermined audio feature comprises at least pitch (**Col 6 lines 45-47**).

With respect to claim 3, Blum discloses the predetermined audio feature comprises at least one Mel-frequency cepstral coefficient (**Col 6 lines 45-47**).

With respect to claim 4, Blum discloses the predetermined audio feature comprises at least sharpness (**Col 6 lines 45-47**, brightness).

With respect to claim 7, Blum discloses at least one further audio feature is defined as at least one coefficient obtained by performing a discrete cosine transformation on the result of a frequency analysis (**Col 13 lines 15-17, 32-34**, the MFCCs are obtained by performing a discrete cosine transform on the FFT result).

With respect to claim 9, Blum discloses music system comprising: means for playing audio data from a medium, (**Col 5 lines 29-40**) in addition to a system as

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claimed in claim 8 for classifying said audio data (**See claim 1**).

With respect to claim 10, Blum discloses a multi-media system (**Fig 1**) comprising: means for playing audio data (**Fig 1 UI Adapter 124**) from a medium (**Fig 1 ROM 104**); a system as claimed in claim 8 for classifying said audio data (**See claim 1**); means for displaying video data from a further medium; (**Fig 1 Display Adapter 126**) means for analyzing said video data (**Fig 1 CPU 102**); and

means for combining the results obtained from analyzing said video data with the results obtained from classifying said audio data (**Fig 1, CPU 102 and Display Adapter 126**, the results would be combined and presented on the display by these means).

With respect to claim 13, Blum does not specifically mention a log power spectrum of said extracted predetermined audio feature.

Sheirer discloses a log power spectrum of said extracted predetermined audio feature (**p1131 Col 2**, perceptual channels energy).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Blum such that performing a frequency analysis on a set of values of said extracted predetermined audio features at different time instances results in a log power spectrum of said extracted predetermined audio feature, which would be a more useful metric for classifying sounds intended to be heard by humans, who have a logarithmic perception of sound.

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7. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum et al. (5,918,223) in view of Sheirer et al. ("Construction and Evaluation of a Robust Multifeature Speech/Music Discriminator". Proceedings of the 1997 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP '97), Vol 2, p1331-1334), in further view of Repp ("Quantitative Effects of Global Tempo on Expressive Timing in Music Performance: Some Perceptual Evidence. Music Perception, Fall 1995, Vol. 13 No. 1, p39-57).

With respect to claim 5, Blum discloses the deriving step comprises the steps of:  
calculating an average value of said set of values of said extracted  
predetermined audio feature at different time instances (**Col 15 lines 43-44**, taking an FFT produces frequency coefficients, the lowest of which is the DC value, or time average, of the signal for the given frame);

defining at least one frequency band (**Col 15 lines 43-44**, taking an FFT defines at least one frequency bin);

calculating the amount of energy within said frequency band from said frequency analysis (**Col 15 lines 43-44**, taking an FFT calculates coefficients representative of the amount of energy in each frequency bin); and

defining said further audio feature as said amount of energy (**Col 15 lines 44-46**).

Blum and Shierer do not specifically mention defining said further audio feature as said amount of energy divided by said average value.

Repp discloses defining a audio feature as an amount of energy divided by an average value (**p41**, calculation of relative modulation depth requires dividing energy by an average value).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Blum and Sheirer by defining said further audio feature as said amount of energy divided by said average value, in order to make the feature more robust to tempo fluctuations, as suggested by Repp (**p41**).

With respect to claim 6, Blum discloses at least one of the following frequency bands are used in said frequency analysis: 1-2 Hz; 3-15 Hz; and 20-150 Hz (**Col 6 lines 65-67, and Col 15 lines 43-44**, at the sampling rates disclosed, at least these frequency bands would be represented by the FFT spectrum). However, Blum does not specifically disclose modulation frequencies.

Scheirer et al. disclose an audio classifier in which the 4Hz modulation frequency energy of the signal is analyzed (**p1131 Section 2**). It was well known to those skilled in the art at the time of the invention that speech tends to have more modulation energy at 4Hz than music does (**See Scheirer p1131 Section 2**).

It would have been obvious to try a 3-15Hz modulation frequency parameter as a feature in Blum's invention for the following reasons: there was a recognized need in the field to develop better classification features (**See Scheirer p1131 Section 1**); there were a finite number of identified, predictable ranges that would include the well known 4Hz frequency; one of ordinary skill could have readily pursued the known ranges with a



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reasonable expectation of success; and one of ordinary skill could have used readily available software to modify the parameter range.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse Pullias whose telephone number is 571/270-5135. The examiner can normally be reached on M-F 9:00 AM - 4:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571/272-7843. The fax phone number

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for the organization where this application or proceeding is assigned is 571/270-6135.

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jesse S. Pullias/  
Examiner, Art Unit 2626

/Talivaldis Ivars Smits/  
Primary Examiner, Art Unit 2626

11/10/2008